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Frontiers in Geoscience Colloquium

Monday, November 14, 2016

3:00pm – 4:00pm

Physics Auditorium (TA-3, Bldg 215)

Including Estuary Processes in Earth System Models

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Estuaries are important areas for mixing between riverine freshwater and coastal ocean saltwater. Estuarine exchange flow increases the salinity of the buoyant outflow to the ocean. More generally, estuarine processes transform physical and biogeochemical water properties. These transformations can influence water properties, circulation, and ecosystems in the open ocean. Earth system models, however, typically lack the horizontal and vertical resolution to fully resolve estuaries. New modeling advances now make it feasible to resolve estuaries. Nevertheless, lower resolution Earth system models will continue to be used; especially for runs including the full suite of biogeochemical tracers. An approach to parameterize estuary processes for lower resolution Earth system models will be discussed. Specifically development of and results for an estuary box model applied to the Community Earth System Model will be described. Global results and results for the Columbia River and Amazon case studies are presented. Challenges for representing estuarine physical and biogeochemical processes and evaluating performance in higher resolution Earth system models also will be discussed. The example estuary for this discussion is the Long Island Sound, a major U.S. urban estuary.

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